

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 04 JAN 2005

PCT PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2004/006737

International filing date (day/month/year)  
04.03.2004

Priority date (day/month/year)  
05.03.2003

International Patent Classification (IPC) or both national classification and IPC  
H04Q7/22

Applicant  
QUALCOMM, INCORPORATED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Bösch, M

Telephone No. +49 89 2399-7523



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2004/006737

---

**Box No. I Basis of the opinion**

---

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2004/006737

---

**Box No. II Priority**

---

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

---

**Box No. IV Lack of unity of invention**

---

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

☒ paid additional fees.

☐ paid additional fees under protest.

☐ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

☐ complied with

☒ not complied with for the following reasons:

**see separate sheet**

4. Consequently, this report has been established in respect of the following parts of the international application:

☒ all parts.

☐ the parts relating to claims Nos.

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2004/006737

---

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

1. Statement

Novelty (N)	Yes: Claims	2-5,8-15,19-20,22-29,31-34,37-41
	No: Claims	1,6,7,16-18,21,30,35,36,42,43
Inventive step (IS)	Yes: Claims	
	No: Claims	1-43
Industrial applicability (IA)	Yes: Claims	1-43
	No: Claims	

2. Citations and explanations

**see separate sheet**

---

**Box No. VI Certain documents cited**

---

1. Certain published documents (Rules 43bis.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

**see form 210**

**Concerning Section I.**

**Basis of the report**

Reference is made to the following documents, which are cited in the International Search Report:

- D1: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Location Services (LCS); Functional description; Stage 2 (3GPP TS 23.271 version 5.5.0 Release 5); ETSI TS 123 271" ETSI STANDARDS, EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE, SOPHIA-ANTIPO, FR, vol. 3-SA2, no. V550, December 2002 (2002-12), XP014007893 ISSN: 0000-0001
- D2: US 2001/009544 A1 (RUUTU VILLE ET AL) 26 July 2001 (2001-07-26)
- D3: US 6 195 557 B1 (HAYES STEPHEN ET AL) 27 February 2001 (2001-02-27)
- D4: WO 01/37477 A (VERIZON LAB INC) 25 May 2001 (2001-05-25)
- D5: WO 02/076118 A (SIGNALSOFT CORP) 26 September 2002 (2002-09-26)
- D6: WO 00/76171 A (NOKIA NETWORKS OY ; RUUTU VILLE (FI); STAACK JENS (FI); TANG HAITAO (F) 14 December 2000 (2000-12-14)
- D7: WO 03/045084 A (KOKKONEN PETRI ; MAANOJA MARKUS (FI); NOKIA CORP (FI)) 30 May 2003 (2003-05-30)
- D8: US 2002/086682 A1 (NAGHIAN SIAMAK) 4 July 2002 (2002-07-04)
- D9: US-B-6 169 899 B1 (ROEL-NG MAYA ET AL) 2 January 2001 (2001-01-02)
- D10: EP-A-1 276 336 (NORTEL NETWORKS LTD) 15 January 2003 (2003-01-15)
- D11: WO 2004/075591 A (QUALCOMM INC ; SHEYNBLAT LEONID (US)) 2 September 2004 (2004-09-02)
- D12: US 2002/019698 A1 (MATTILA ARTO ET AL) 14 February 2002 (2002-02-14)
- D13: US 6 185 427 B1 (COLEMAN DAVID ET AL) 6 February 2001 (2001-02-06)

**Concerning Section VI,**  
**Certain documents cited:**

Certain published documents (see Rule 70.10 PCT)

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
D7=WO03/045084	30.5.03	19.11.01	-
D11=WO 2004/075591	2.9.04	9.2.04	18.2.03

**Concerning Section IV,**  
**Lack of unity of invention**

- 1 The application lacks unity in the sense of Rule 13.1 PCT, because the following 4 separate claimed groups of claimed inventions are not so linked as to form a single general inventive concept:
- 2 **Claims 1-3, 6-19, 21, 36, 38-40, 42 and 43** relate to a first group of inventions dealing with several implementation details of the standardized location service architecture and method (see paragraph 5 below), mainly comprising:
  - a) a first (sub)invention (Claims 2, 3 and 19) in which different security procedures are respectively applied for location determination and location disclosure
  - b) a second (sub)invention (Claims 6, 21 and 42) dealing with the disclosure of cached information
  - d) a third (sub)invention (Claims 7 and 36-43) dealing with entities in a home and visited network, e.g. in form of a user plane architecture (Claims 38-40)
  - c) a fourth (sub)invention (Claims 9 and 10) deals with different alternatives for locating location client and location server
- 3 Second invention: **Claims 22 and 23** define a mobile station (and corresponding program product for) performing a first function for obtaining location information for the mobile station by interacting with at least one peer first function located in a first set of at least one network entity, and performing a second function for providing the location information by interacting with at least one peer second function located in a second set of at least one network entity.

- 4 Third invention: **Claims 4, 5, 20, 24-29, 37 and 41** provide respective LCS sessions (with separate session keys) for location determination and location provisioning.
- 5 Fourth invention: In **Claims 30-35**, obtained location information is provided to a first and a second application.
- 6 The common concept linking together these four groups of claims is a method (and corresponding architecture) of providing location services (see D1, title, see D2, title), comprising the steps of:
  - performing location determination via at least one network entity to obtain location information (see D1, paragraphs 6.3.3 and 6.3.4, elements VMSC, SGSN, MSC or UE, see D2, paragraphs 59, 60, 62, 64, elements MS, BSS, SMLC)
  - performing location disclosure via a second set of at least one network entity to provide the location information for the mobile station (see D1, paragraph 6.3.3, element GMLC, paragraph 9.1.1, step 5, see D2, paragraph 65, element GMLC).
- 7 However, this method is generally known in the art, cf. the 3GPP-location service standard D1 and e.g. the prior art document D2 cited in the Search Report.
- 8 Since this common concept is neither novel nor inventive and no technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT exists between the subject-matter of the above listed groups of claims, the application lacks unity within the meaning of Rule 13.1 PCT, which states that a single general inventive concept must be formed by the claims. Such a single inventive concept cannot be found in the present claims.

**Concerning Section V,**

**Reasoned statement with regard to novelty, inventive step or industrial applicability**

- 1 The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of **Claim 1** is not novel.
  - 1.1 The claimed subject-matter is not novel, because the closest prior art represented

by document D1 and also D2 already disclose the claimed method (see references of section VI, paragraph 5 above).

- 1.2 Accordingly all features of independent Claim 1 are known from D1 and D2 and its claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.
- 2 As the apparatus **Claim 18** is adapted to implement the method of Claim 1 without defining any additional features, it lacks novelty in the sense of Article 33(2) PCT for the same reasons as listed under point 1.
- 3 The subject-matter of **Claims 36 and 43** differ from the subject-matter of Claims 1 and 18 in that the entity (entities) performing location determination are in a serving network and the entity (entities) performing location disclosure are in a home network.
  - 3.1 However, document D1 already discloses that the GMLC (which provides the location information) can be in another PLMN than the VMSC/MSC (which determines the location information) (see D1, paragraph 9.1.2.1, step 3), and that the GMLC can be in the same core network as the HLR of the subscriber (see figure 6.2), which implies that the GMLC can be part of the home network. (Remark: The coexistence of GMLC and LCS client in the home network can also be derived from in D1, paragraphs 5.2 "LCS client and LCS server within PLMN", 5.5.2 "LCS server (GMLC)" and 6.3.2 "LCS client in the HPLMN").
  - 3.2 The claimed subject-matter is therefore also not novel, contrary to Article 33(2) PCT.
- 4 Furthermore, it is pointed out that should the Applicant dispute the aforementioned novelty objection based on minor differences of interpretation between some of the features of independent Claim 36 and 43 and the features of D1, their claimed subject-matter would still not seem to involve an inventive step (see Article 33(3) PCT) in the light of the above cited document D1 alone or in combination with D3, which discloses the coexistence of LCS client and the GMLC in the same PLMN and the MLC/VLR/MSC in another PLMN (see D3, figure 3, elements 380, 395 and column 6, lines 32-35).
- 5 Concerning the second invention, the present application does not meet the requirements of the PCT, because the subject-matter of **Claims 22 and 23** does



not involve an inventive step in the sense of Article 33(3) PCT.

- 5.1 Document D8, which is considered to represent the closest state of the art, already specifies a wireless mobile station comprising means for:
- performing a first function to obtain location information for the mobile station, wherein the first function interacts with at least one peer first function located in a first set of at least one network entity to obtain the location information (see D8, figure 6, the functions PCF and PSMF in the MS, the peer functions PRCF, PRRM in the RNC, paragraphs 116-125), and
  - performing a second function to provide the location information, wherein the second function interacts with at least one peer second function located in a second set of at least one network entity to provide the location information (see D8, figure 6 in combination with paragraph 86, LCS client being in mobile station, LCF interacting with peer functions LCCF, LCAF, LCCTF, LSBF and LSOF in the LCS server, e.g. a GMLC, paragraphs 89-91, 108-112).
- 5.2 In view of the fact that the person skilled in the art knows the general teachings in designing mobile stations, and in particular that their algorithms are implemented either in software for being run on a processor, in ASICs, in some kind of gate arrays (e.g. FPGAs, ...) or in a mixture of such kind of implementations, the claimed software implementation of the method described in document D8 in a mobile station having a processor is just an obvious design possibility for the person skilled in the art.
- 5.3 In addition, the storage of the software on a program product comes within the common practice of the skilled person and as such is considered as not involving an inventive step.
- 5.4 Thus, the subject-matter of both claims does not involve an inventive step and does not satisfy the criterion set forth in Article 33(3) PCT.
- 6 Concerning the **third invention**, the present application does not meet the requirements of the PCT, because the subject-matter of **Claim 24** does not involve an inventive step in the sense of Article 33(3) PCT.
- 6.1 Document D9, which is considered to represent the closest prior art, discloses a method for providing location information comprising the steps of:
- when the mobile station is attached and not idle or when it is idle and paging was

successful, performing location information determination to obtain location information for a mobile station, storing the location information as historical location information in the MSC/VLR and performing location disclosure to provide the location information (see D9, column 5, lines 38-50, column 6, lines 1-37, figure 4A, steps 440, 445, 450, 455, 460 and figure 4B, all steps),  
- otherwise only performing location disclosure to provide the historical location information for the mobile station (see D9, figure 4A, steps 440, 445, 450, 468 and 469).

- 6.2 Although it appears to be implicitly contained, Document D9 does not explicitly refer to two succeeding sessions.
- 6.3 The claimed two sessions cannot be considered as involving an inventive step according to Article 33(3) PCT, because the call of two succeeding location requests each defining an LCS session comes within the common practice of the skilled person (see for instance D5, page 62, line 33, page 63, line 12) and as such is considered as not involving an inventive step.
- 6.4 Thereby, the fact that the claimed subject-matter only exists when the mobile station is attached and not idle or when it is idle and paging was successful in the first LCS session, and when the mobile station is not attached or idle and paging was not successful in the second LCS session, is an appliance of the method derivable from D9 in a specific situation but does not imply a technical feature with inventive significance.
- 6.5 Hence, no inventive step in the sense of Article 33(3) PCT is apparent in the subject-matter of independent Claim 24.
- 7 For the same reason as just explained, the corresponding apparatus **Claim 29** does not involve the inventive step required by Article 33 (3) PCT.
- 8 Concerning the **fourth invention**, the subject-matter of present independent **Claims 30 and 35** is not novel (see Article 33 (2) PCT) in the light of prior art document D12 disclosing a method (system) of providing location services (see D12, title), comprising (means for):  
- obtaining location information for a mobile station (see D12, paragraphs 50, 63, 68, 79)

- providing the location information to a first application (see D12, paragraphs 52, 69), and
- providing the location information to a second application (see D12, paragraph 69).

Accordingly all features of both independent claims are known from D12 and their claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.

- 9 The dependent **Claims 2-17, 19-21, 25-28, 31-34, and 37-42** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to novelty or inventive step, the reasons therefore are that their features have already been employed for the same purpose in the prior art (**Claims 2, 3, 19 and 26**: see D1, paragraphs 5.4.1.1, 5.4.1.2, 5.4.3.1, 6.3.3, 9.1.1-step 1, 9.1.2.1-step 3, see D3, column 6, lines 40-57, see D4, page 12, lines 8-11, 22-28, **Claims 4, 20 and 27**: see D1, paragraph 9.2.1, **Claim 5**: see paragraph 6 above, **Claims 6, 21, 32 and 42**: see D1, paragraphs 9.1.4.3 and 9.1.4.5.1, see D5, page 34, lines 25-33, **Claim 7**: see paragraph 3 above, **Claims 8-10 and 14**: see D1, figure 5.2, paragraphs 5.5.2, 6.3.2, **Claims 11, 12**: see D2, figure 1D, elements SMLC, LMU, **Claims 13, 15**: implicit in D1, paragraph 5.4.3.1, see D6, page 11, last line - page 12, line 3, page 13, line 28- page 14, line 1, page 15, lines 7-11, page 17, lines 18-23, **Claims 16 and 17**: see D1, paragraph 7.1.2, **Claim 25**: see D5, page 63, line 1, **Claims 28 and 33**: see D5, page 49, lines 25-28, page 52, lines 9-15, page 53, lines 14-16, page 55, lines 3-5, 21, **Claim 34**: see D5, page 54, line 30-page 55, line 3, page 55, lines 25-33, see also D3, column 6, lines 32-35, **Claims 38-40**: see D6, page 19, lines 11-25) or consist of slight constructional changes which come within the scope of the customary practice followed by persons skilled in the art.
- 10 Since the claimed inventions and their claimed embodiments are either already industrially applied or are at least suggested by combinations of the above indicated documents, the requirements of Article 33(4) PCT are fulfilled.
- 11 **Remarks concerning clarity of the international application:**
- 11.1 Contrary to Article 6 PCT, the features "first/second function interacts" in the apparatus **Claims 22 and 23** relate to method-steps rather than imposing any clear restrictions on the apparatus itself.

In order to meet the requirements of Article 6 PCT, these claims should have been recast by formulations like "*means adapted for doing*", "*adapted to do*", "*arranged to do*" or "*means for doing*" in order to make the intended limitations clear.

11.2 In addition, **Claim 23** does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not defined. The claim attempts to define the subject-matter in terms of the result to be achieved ("instructions to"), whereas it is possible to clearly define this functionality, for instance by "instructions for performing a first/second function".

12 **Remarks concerning formal defects in the international application:**

- If possible in the light of Article 6 PCT, the independent claims should have been drafted in the proper two-part "characterised" form recommended by Rule 6.3.(b),(i),(ii) PCT, having a preamble that correctly reflects the nearest prior art, presumably that represented by the above noted D1 or D2.

- The statement of the invention should have been brought into conformity with the wording of the claims.

- In order to meet the requirements of Rule 5.1.(a),(ii) PCT, at least the documents D1, D2, D9 and D12 should have been identified in the description and the relevant background art disclosed therein should have been briefly discussed.

- The features of the claims should have been provided with reference signs placed in parentheses to increase the intelligibility of the claims (see Rule 6.2 (b) PCT).

However, the bracketed features of Claims 1 and several other claims (i.e. Claims 3, 11, 12, ...) are no reference signs. Consequently, these abbreviations should be separated by another type of punctuation mark, a different type of brackets or should be omitted (cf. analogous Rule 11.13 l) und 11.13 m) PCT). For clarity reasons, abbreviations used in the claims should be defined in their extended form in the first claim they are used.

- The general "*spirit and scope*" statements in the description at paragraph 1128 imply that the subject-matter for which protection is sought may be different to that

defined by the claims, thereby resulting in lack of clarity (see Article 6 PCT) when used to interpret them. These statements should therefore have been deleted to remove this inconsistency.

- Paragraph 1000 contains irrelevant matter and should therefore have been deleted according to Rule 9.1 iv) PCT.

- The requirements of Rule 11.8 PCT are not met. In addition, if the numbering of paragraphs is maintained, it should start with 1.

- The attention of the Applicant is finally drawn to the fact that, when entering the national phase, the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (see Articles of the national law corresponding to Article 34.2(b) PCT like e.g. Article 123(2) EPC).

- In order to facilitate the examination of the conformity of the amended application with the requirements of these Articles, the Applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).